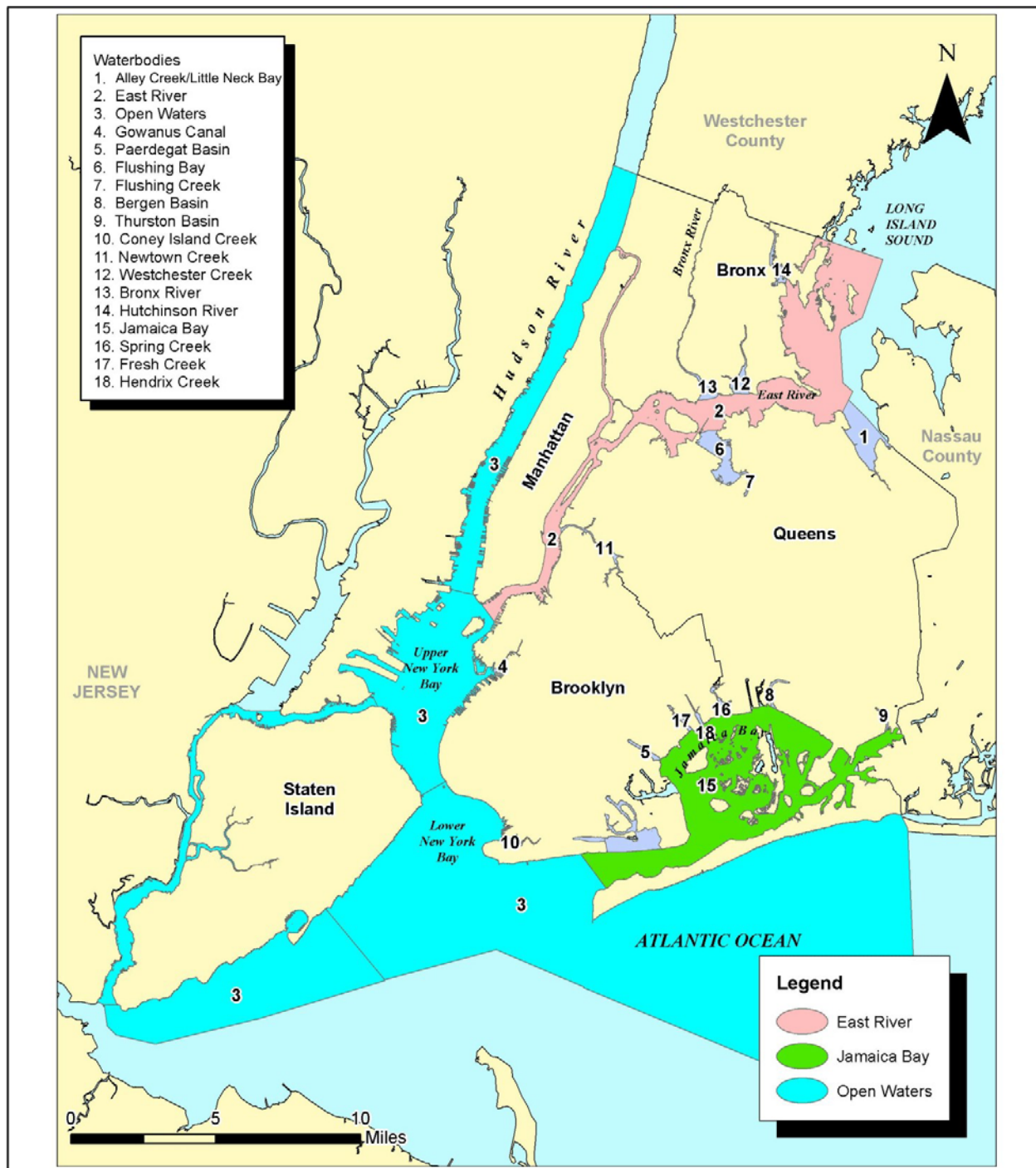


1.0 Introduction

The City of New York owns and operates 14 water pollution control plants (WPCPs) and their associated collection systems through the New York City Department of Environmental Protection (NYCDEP). The system contains approximately 450 combined sewer overflows (CSOs) located throughout the New York Harbor complex. NYCDEP is executing a comprehensive watershed-based approach to long-term CSO control planning to address the impacts of these CSOs on the water quality and use of the waters of New York Harbor. As illustrated in Figure 1-1, multiple waterbody assessments are being conducted that consider all causes of non-attainment of water quality standards and identify opportunities and requirements for maximizing beneficial uses. This Long-Term CSO Plan (LTCP) report, Alley Creek and Little Neck Bay Waterbody/Watershed Facility Plan Report, provides the details of the assessment and the actions that will be taken to improve water quality in one of these waterbodies, Alley Creek and Little Neck Bay (Item 1 in Figure 1-1.)

New York City's environmental stewardship of the New York Harbor began in 1909 with water quality monitoring "to assess the effectiveness of New York City's various water pollution control programs and their combined impact on water quality" that continues today (annual NYCDEP NY Harbor Water Quality Survey Reports, 2000-2007). CSO abatement has been ongoing since the 1950s, when conceptual plans were first developed for the reduction of CSO discharges into Spring Creek in Jamaica Bay. From 1975 through 1977, the City conducted a harbor-wide water quality study funded by a Federal Grant under Section 208 of the Water Pollution Control Act Amendments of 1972. This study confirmed tributary waters in the New York Harbor were negatively affected by CSOs. At that time, dry-weather discharges, which have since been eliminated by NYCDEP, were also occurring. In 1984 a City-wide CSO abatement program was developed that initially focused on establishing planning areas and defining how facility planning should be accomplished. The City was divided into eight individual project areas that together encompass the entire harbor area. Four open water project areas were developed (East River, Jamaica Bay, Inner Harbor and Outer Harbor), and four tributary project areas were defined (Flushing Bay, Paerdegat Basin, Newtown Creek, and Jamaica Tributaries). The State Pollutant Discharge Elimination System (SPDES) permits for each WPCP required development of CSO Facility Plans for each project area. The permits for each WPCP, administered by the New York State Department of Environmental Conservation (NYSDEC), apply to CSO outfalls as well as WPCP discharges and stormwater outfalls. Therefore, the SPDES permits contain conditions for compliance with applicable federal and New York State requirements for CSOs.

In 1992, NYCDEP entered into an Administrative Consent Order with NYSDEC that was incorporated into the SPDES permits with a provision stating that the Consent Order governs NYCDEP's obligations for its CSO program. The 1992 Order was modified in 1996 to add a catch basin cleaning, construction, and repair program. A new Consent Order that became effective in 2005 supersedes the 1992 Consent Order and its 1996 modifications, with the intent to bring all CSO-related matters into compliance with the provisions of the Clean Water Act and New York State Environmental Conservation Law. The new Consent Order contains requirements to evaluate and implement CSO abatement strategies on an enforceable timetable for 18 waterbodies and, ultimately, for city-wide long-term CSO control. NYCDEP and



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LTCP Project Waterbody Assessment Areas

FIGURE 1-1

NYSDEC also entered into a separate Memorandum of Understanding (MOU) to facilitate water quality standards reviews in accordance with the federal CSO control policy.

This Alley Creek and Little Neck Bay LTCP Report is explicitly required by item I.B, Appendix A of the 2005 Consent Order, and is intended to be consistent with the United States Environmental Protection Agency (USEPA) CSO Control Policy. In 1994, USEPA issued a national CSO Policy that requires municipalities to develop a long-term plan for controlling CSOs (i.e., a Long-Term Control Plan or LTCP). The CSO policy became law in December 2000 with the passage of the Wet Weather Water Quality Act of 2000. The approach to developing the LTCP is specified in USEPA CSO Control Policy and Guidance Documents, and involves the following nine minimum elements,

1. System Characterization, Monitoring and Modeling;
2. Public Participation;
3. Consideration of Sensitive Areas;
4. Evaluation of Alternatives;
5. Cost/Performance Consideration;
6. Operational Plan;
7. Maximizing Treatment at the Treatment Plant;
8. Implementation Schedule; and
9. Post Construction Compliance Monitoring Program.

Subsequent sections of the report will discuss each of these elements in more depth, along with the simultaneous coordination with State Water Quality Standards (WQS) review and revision as appropriate. However, it should be noted that the CSO abatement plan discussed herein had been substantially developed by the NYCDEP and approved by the NYSDEC under the 1992 Order prior to implementation of the CSO policy. Therefore, some of the required LTCP requirements are more fully addressed in reference documents. For example, detailed evaluations of water quality and sewer system models and CSO control alternatives can be found in facility planning documents as referenced in the present document and/or other reports generated in association with this report.

1.1 ASSESSMENT AREA

The waterbody portion of the Alley Creek and Little Neck Bay Waterbody/Watershed (WB/WS) Facility Plan assessment area follows the NYSDEC designation of Alley Creek and Little Neck Bay in its Codes, Rules and Regulations. This area is designated as all waters extending into Alley Creek and Little Neck Bay, beginning at the southern, upstream origins of Alley Creek, which is just north of the interchange of the Long Island Expressway and the Cross Island Parkway, to the downstream mouth of Little Neck Bay as it enters the Long Island Sound, between the Fort Totten Military Reservation on the west side and Kings Point on the east side. The NYSDEC lists Alley Creek as an estuary, with a Class I waterbody classification and a size of 18.4 acres. Little Neck Bay is listed as an estuary, with a Class SB waterbody classification and a size of 1,515 acres (NYSDEC, 2002).

The watershed and sewershed of the Alley Creek and Little Neck Bay portion of the assessment area includes the neighborhoods of Bay Terrace, Bayside, Oakland Gardens, Douglaston, and Little Neck within Queens County, including most of Community District 11

and the western portion of Community District 7. On the eastern side of the Little Neck Bay, the watershed and sewershed also includes a portion of the Great Neck Peninsula in Nassau County. Most of the Queens County areas are serviced by the eastern portion of the sewer system tributary to the Tallman Island WPCP, with the exception of some properties on the Douglaston Peninsula that are served by on-site septic systems. The areas adjacent to the bay on its eastern Nassau County shore are served by a mixture of sanitary sewer districts and individual on-site septic systems. Figure 1-2 illustrates the New York City Alley Creek and Little Neck Bay Waterbody/Watershed Facility Plan Assessment Area. The total watershed/sewershed of the assessment area is 4,879 acres. The areas of direct drainage to the waterbody (828 acres), separately sewered areas (2,941 acres), combined sewer areas (918 acres), and “other” (direct drainage areas not immediately adjacent to the waterbody, 192 acres) are shown. The Tallman Island CSO outfalls that discharge to Alley Creek and Little Neck Bay are indicated. CSO outfall TI-025 is the future outfall of overflow from the Alley Creek CSO Retention Facility currently under construction. The discharge location of the Belgrave (Nassau County) WPCP is shown. Community Districts are indicated.

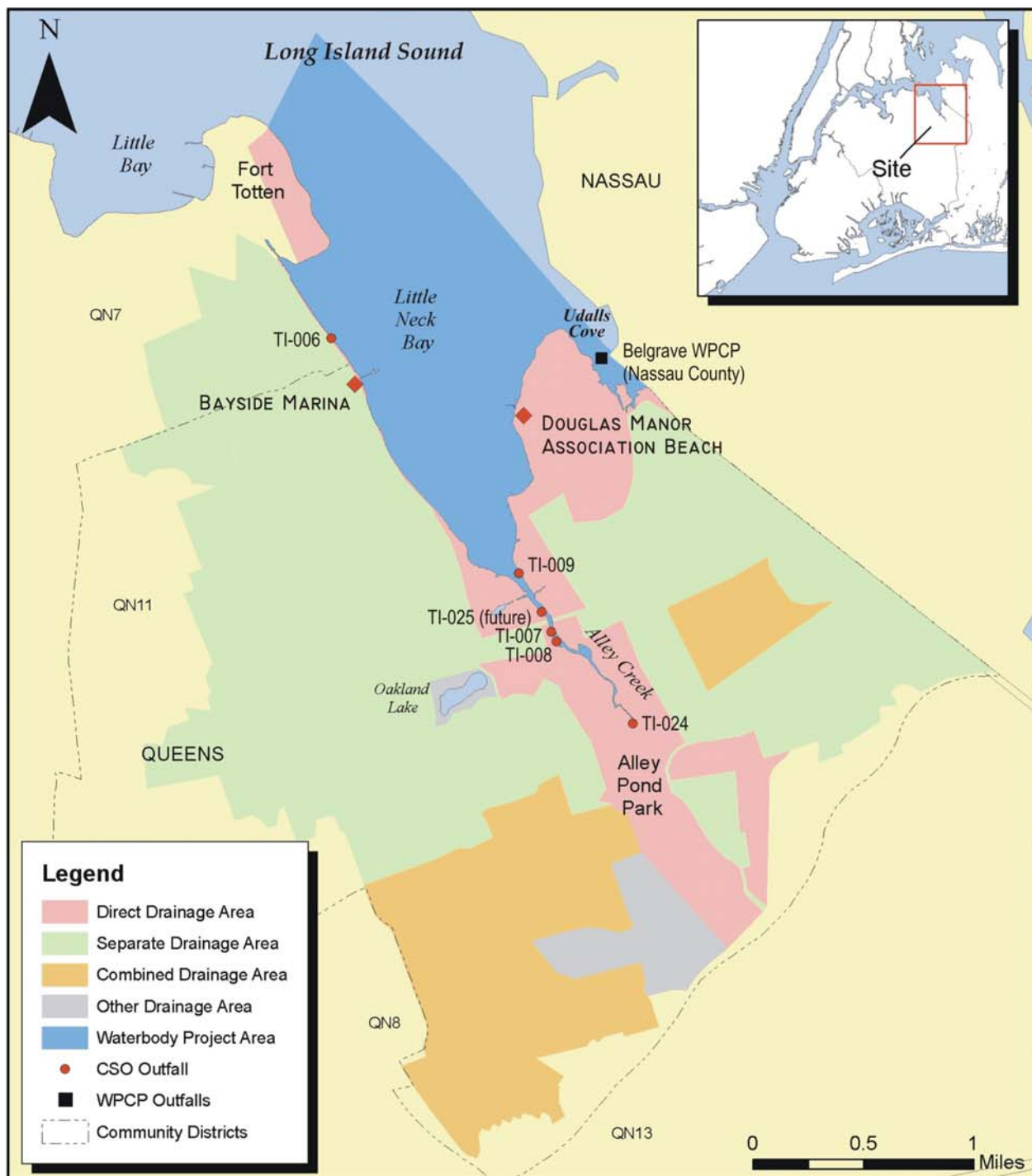
1.2 REGULATORY CONSIDERATIONS

The waters of the City of New York are primarily subject to New York State regulation, but must also comply with the policies of the USEPA, as well as water quality standards established by the Interstate Environmental Commission (IEC). The following sections detail the regulatory issues relevant to long-term CSO planning.

1.2.1 Clean Water Act

Although federal laws protecting water quality were passed as early as 1948, the most comprehensive approach to clean water protection was enacted in 1972, with the adoption of the Federal Water Pollution Control Act Amendments, commonly known as the Clean Water Act (CWA), including the amendments adopted in 1977. The CWA established the regulatory framework to control surface water pollution, and gave USEPA the authority to implement pollution control programs. Among the key elements of the CWA was the establishment of the National Pollutant Discharge Elimination System (NPDES) permit program, which regulates point sources that discharge pollutants into waters of the United States. Combined sewer overflows and municipal separate storm sewer systems (MS4) are also subject to regulatory control under the NPDES program. In New York State, the NPDES permit program is administered by the State through NYSDEC, and is thus a SPDES program. New York has had an approved SPDES program since 1975.

The CWA requires that discharge permit limits are based on receiving water quality standards (WQS) established by the State. These standards should “wherever attainable, provide water quality for the protection and propagation of fish, shellfish and wildlife and for recreation in and on the water and take into consideration their use and value of public water supplies, propagation of fish, shellfish, and wildlife, recreation in and on the water, and agricultural, industrial, and other purposes including navigation” (40 CFR 131.2). The standards must also have an antidegradation policy for maintaining water quality at acceptable levels, and a strategy for meeting these standards must be developed for those waters not meeting WQS. The most common type of strategy is the development of a Total Maximum Daily Load (TMDL). TMDLs



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FIGURE 1-2

determine what level of pollutant load would be consistent with meeting WQS. TMDLs also allocate acceptable loads among sources of the relevant pollutants.

Section 305(b) of the CWA requires states to periodically report water quality of waterbodies under their respective jurisdictions and Section 303(d) requires states to identify impaired waters where specific designated uses are not fully supported. The NYSDEC Division of Water addresses these requirements by following its Consolidated Assessment and Listing Methodology (CALM). The CALM includes monitoring and assessment components that determine water quality standards attainment and designated use support for all waters of New York State. Waterbodies are monitored and evaluated on a five-year cycle. Information developed during monitoring and assessment is inventoried in the Waterbody Inventory/Priority Waterbody List (WI/PWL). The WI/PWL incorporates monitoring data, information from state and other agencies, and public participation. The Waterbody Inventory refers to the listing of all waters, identified as specific individual waterbodies that are assessed within the state. The Priority Waterbodies List is the subset of waters in the Waterbody Inventory that have documented water quality impacts, impairments or threats. The Priority Waterbodies List provides the candidate list of waters to be considered for inclusion on the Section 303(d) List.

In 1998, NYSDEC listed Little Neck Bay as a high priority waterbody for TMDL development with its inclusion on the Section 303(d) List. The cause of the listing was pathogens due to CSO discharges and urban and storm runoff. Little Neck Bay continues to be listed on the 303(d) List for Pathogens through 2008 (most current list). “Alley Creek/Little Neck Bay Tributary” was listed for the first time on the 2004 Section 303(d) List as a high priority waterbody for oxygen demand. The 2008 NYSDEC 303(d) List includes the Alley Creek/Little Neck Bay Tributary as impaired for dissolved oxygen caused by oxygen demand. The 2008 303(d) List sources of both pathogen impairment in Little Neck Bay and dissolved oxygen (DO) impairment in Alley Creek/Little Neck Bay Tributary are listed as CSOs, urban runoff and stormwater. The Alley Creek and Little Neck Bay waters are included in “Part 3c” of the 2008 303(d) List. Part 3c lists “Waterbodies for which TMDL Development May be Deferred (Pending Implementation/Evaluation of Other Restoration Measures).” The Alley Creek/Little Neck Bay Tributary and Little Neck Bay are specifically noted that “Impairments to these waters are being addressed by 2005 Order on Consent with NYC directing the city to develop and implement watershed and facility plans to address CSO discharges and bring New York City waters into compliance with the Clean Water Act. This may include a revision of water quality standards based on a Use Attainability Analysis if fishable/swimmable goals of the CWA are not attainable. NYSDEC remains committed to the development of harbor-wide TMDLs for nutrients, pathogens and toxins. However, it is appropriate to defer development of separate TMDLs for these individual CSO-impacted waterbodies in light of the enforceable requirements of the NYC CSO Consent Order.” (NYSDEC, 2008).

Another important component of the CWA is the protection of uses. USEPA regulations state that a designated use for a waterbody may be refined under limited circumstances through a Use Attainability Analysis (UAA). In the UAA, the state would demonstrate that one or more of a limited set of situations exists to make such a modification. First, it could be shown that the current designated use cannot be achieved through implementation of applicable technology-based limits on point sources or cost-effective and reasonable management practices for nonpoint sources. Alternatively, a determination could be made that the cause of non-attainment is due to natural background conditions or irreversible human-caused conditions. Another alternative

would be to establish that attaining the designated use would cause substantial environmental damage or substantial and widespread social and economic costs. If the findings of a UAA suggest authorizing the revision to a use or modification of a water quality standard is appropriate, the analysis and the accompanying proposal for such a modification must go through public participation and the USEPA review and approval processes.

1.2.2 Federal CSO Policy

The first national CSO Control Strategy was published by USEPA in the Federal Register on September 8, 1989 (54 FR 37370). The goals of this strategy were to minimize water quality, aquatic biota, and human health impacts from CSOs by ensuring that CSO discharges comply with the technology and water quality based requirements of the CWA. On April 19, 1994, USEPA officially noticed the CSO Control Policy (59 FR 18688), which established a consistent national approach for controlling discharges from all CSOs to the waters of the United States. The CSO Control Policy provides guidance to permittees and NPDES permitting authorities such as NYSDEC on the development and implementation of an LTCP in accordance with the provisions of the CWA to attain water quality standards. On December 15, 2000, amendments to Section 402 of the CWA (known as the Wet Weather Water Quality Act of 2000) were enacted, incorporating the CSO Control Policy by reference.

USEPA has stated that its CSO Control Policy represents a comprehensive national strategy to ensure that municipalities, permitting authorities, water quality standards authorities and the public engage in a comprehensive and coordinated planning effort to achieve cost-effective CSO controls that ultimately meet appropriate health and environmental objectives and requirements (USEPA, 1995a). Four key principles of the CSO Control Policy ensure that CSO controls are cost-effective and meet the objectives of the CWA:

1. Clear levels of control are provided that would be presumed to meet appropriate health and environmental objectives;
2. Sufficient flexibility is allowed to municipalities to consider the site-specific nature of CSOs and to determine the most cost-effective means of reducing pollutants and meeting CWA objectives and requirements;
3. A phased approach to implementation of CSO controls is acceptable; and
4. Water quality standards and their implementation procedures may be reviewed and revised, as appropriate, when developing CSO control plans to reflect the site-specific wet weather impacts of CSOs.

In addition, the CSO Control Policy clearly defines expectations for permittees, WQS authorities, and NPDES permitting and enforcement authorities. Permittees were expected to have implemented USEPA's nine minimum controls (NMCs) by 1997, after which long-term control plans should be developed. The NMCs are embodied in the 14 Best Management Practices (BMPs) required by NYSDEC as discussed in Section 5.3, and include:

1. Proper operations and maintenance of combined sewer systems and combined sewer overflow outfalls;
2. Maximum use of the collection system for storage;

3. Review and modification of pretreatment requirements to determine whether nondomestic sources are contributing to CSO impacts;
4. Maximizing flow to the Publicly Owned Treatment Works (POTWs);
5. Elimination of CSOs during dry weather;
6. Control of solid and floatable material in CSOs;
7. Pollution prevention programs to reduce contaminants in CSOs;
8. Public notification; and
9. Monitoring to characterize CSO impacts and the efficacy of CSO controls.

WQS authorities should review and revise, as appropriate, State WQS during the CSO long-term planning process. NPDES permitting authorities should consider the financial capability of permittees when reviewing CSO control plans.

In July 2001, USEPA published *Coordinating CSO Long-Term Planning with Water Quality Standards Reviews*, additional guidance to address questions and describe the process of integrating development of CSO long-term control plans with water quality standards reviews (USEPA, 2001d). The guidance acknowledges that the successful implementation of an LTCP requires coordination and cooperation among CSO communities, constituency groups, states and USEPA using a watershed approach. As part of the LTCP development, USEPA recommends that WQS authorities review the LTCP to evaluate the attainability of applicable water quality standards. The data collected, analyses and planning performed by all parties may be sufficient to justify a water quality standards revision if a higher level of designated uses is attainable or if existing designated uses are not reasonably attainable. If the latter is true, then the USEPA allows the state WQS authorities to consider several options:

- Apply site-specific criteria;
- Apply criteria at the point of contact rather than at the end-of-pipe through the establishment of a mixing zone, waterbody segmentation, or similar;
- Apply less stringent criteria when it is unlikely that recreational uses will occur or when water is unlikely to be ingested;
- Subcategories of uses, such as precluding swimming during or immediately following a CSO event or developing a CSO subcategory of recreational uses; and
- A tiered aquatic life system with subcategories for urban systems.

If the waterbody supports a use with more stringent water quality requirements than the designated use, USEPA requires the State to revise the designated use to reflect the higher use being supported. Conversely, USEPA requires that a UAA be performed whenever the state proposes to reduce the level of protection for the waterbody. States are not required to conduct UAAs when adopting more stringent criteria for a waterbody. Once water quality standards are revised, the CSO Control Policy requires post-implementation compliance monitoring to evaluate the attainment of designated uses and water quality standards and to determine if further water quality revisions and/or additional long-term control planning is necessary. USEPA provides a schematic chart (Figure 1-3) in its guidance for describing the coordination of LTCP development and water quality standards review and revision (USEPA, 2001d). This WB/WS

Facility Plan is the work product between steps 4 and 5 on Figure 1-3. This plan will form the basis for the LTCP for Alley Creek and Little Neck Bay.

It is important to note that New York City's CSO abatement efforts were prominently displayed as model case studies by USEPA during a series of seminars held across the United States in 1994 to discuss the CSO Control Policy with permittees, WQS authorities, and NPDES permitting authorities (USEPA, 1994). New York City's field investigations, watershed and receiving water modeling, and facility planning conducted during the Paerdegat Basin Water Quality Facility Planning Project were specifically described as a case study during the seminars. Additional NYCDEP efforts in combined sewer system characterization, mathematical modeling, water quality monitoring, floatables source and impact assessments, and use attainment were also displayed as model approaches to these elements of long-term CSO planning.

1.2.3 New York State Policies and Regulations

In accordance with the provisions of the Clean Water Act, the State of New York has established water quality standards for all navigable waters within its jurisdiction. The State has developed a system of waterbody classifications based on designated uses that includes five saline classifications for marine waters, as shown in Table 1-1.

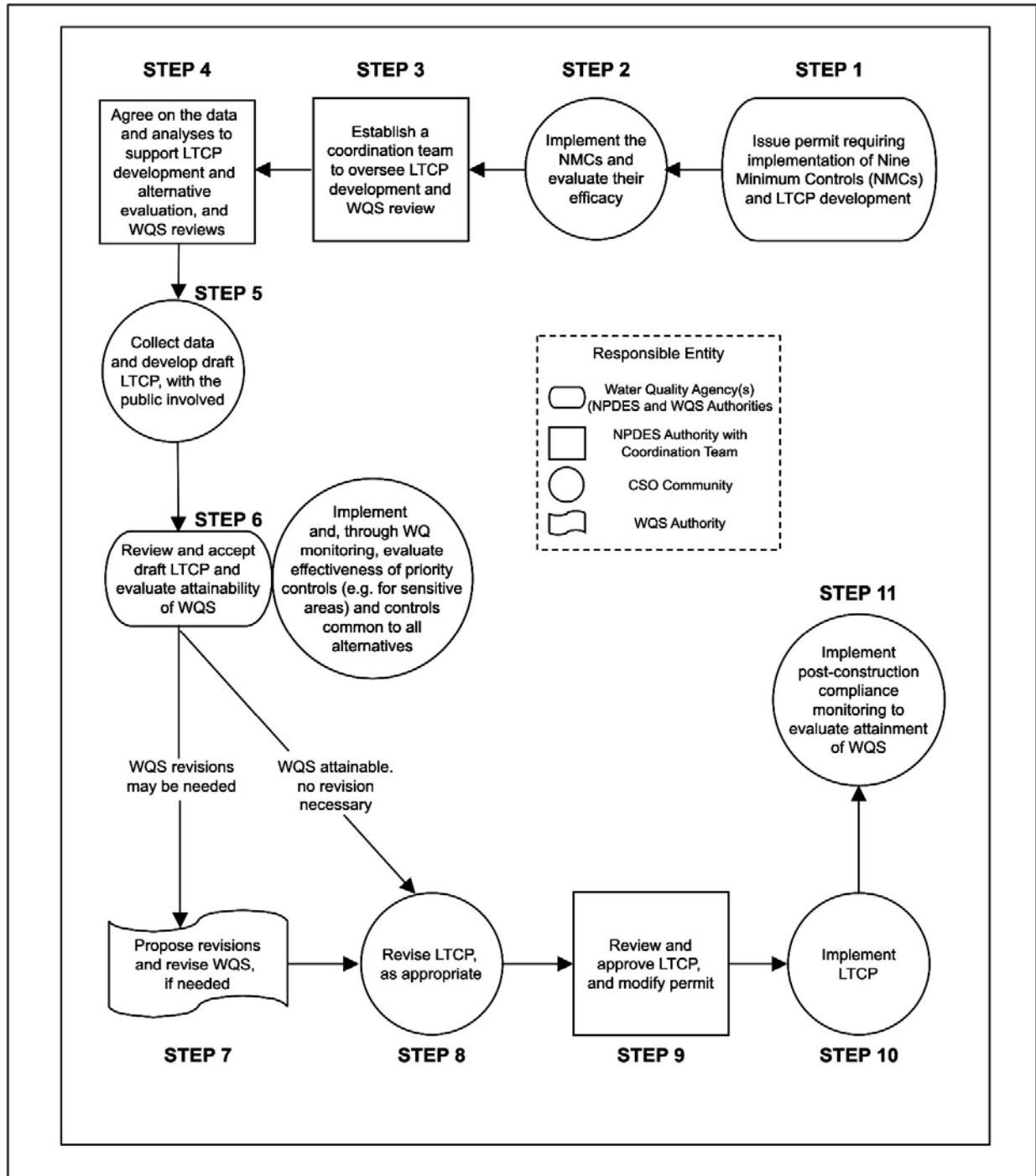
NYSDEC considers the SA and SB classifications to fulfill the Clean Water Act goals of fully supporting aquatic life and recreation. Class SC supports aquatic life and recreation but the recreational use of the waterbody is limited due to other factors. Class I supports the Clean Water Act goal of aquatic life protection and supports secondary contact recreation. SD waters shall be suitable only for fish, shellfish and wildlife survival because natural or manmade conditions limit the attainment of higher standards. NYSDEC has classified Alley Creek as Class I and Little Neck Bay as Class SB.

Dissolved Oxygen

Dissolved oxygen is the numerical standard that NYSDEC uses to establish whether a waterbody supports aquatic life uses. The numerical dissolved oxygen standard for Alley Creek (Class I) requires that dissolved oxygen concentrations shall not be less than 4.0 mg/L at any time at any location within Alley Creek. Little Neck Bay Class SB dissolved oxygen standards include an acute and a chronic exposure component. The ambient water quality dissolved oxygen chronic standard is a minimum daily average of 4.8 mg/L with allowable excursions (see Table 1-1) between 4.8 and 3.0 mg/L (chronic) but never less than 3.0 mg/L (acute).

Bacteria

Total and fecal coliform bacteria concentrations are the numerical standards that NYSDEC uses to establish whether a waterbody supports recreational uses. The numerical bacteria standards for Alley Creek (Class I) require that total coliform bacteria must have a monthly geometric mean of less than 10,000 per 100 mL from a minimum of five examinations. Fecal coliform (Class I) must have a monthly geometric mean of less than 2,000 per 100 mL from a minimum of five examinations. The numerical bacteria standards for Little Neck Bay (Class SB) require that total coliform have a monthly median less than 2,400 per 100 mL and



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Long-Term CSO Control Planning Procedures

FIGURE 1-3

Table 1-1. New York State Numerical Surface Water Quality Standards (Saline)

Class	Usage	Dissolved Oxygen (mg/L)	Total Coliform (MPN/100mL)	Fecal Coliform (MPN/100mL)
SA	Shellfishing for market purposes, primary and secondary contact recreation, fishing. Suitable for fish, shellfish and wildlife propagation and survival.	$\geq 4.8^{(1)}$ $\geq 3.0^{(2)}$	$\leq 70^{(3)}$	N/A
SB	Primary and secondary contact recreation and fishing. Suitable for fish, shellfish and wildlife propagation and survival.	$\geq 4.8^{(1)}$ $\geq 3.0^{(2)}$	$\leq 2,400^{(4)}$ $\leq 5,000^{(5)}$	$\leq 200^{(6)}$
SC	Limited primary and secondary contact recreation, fishing. Suitable for fish, shellfish and wildlife propagation and survival.	$\geq 4.8^{(1)}$ $\geq 3.0^{(2)}$	$\leq 2,400^{(4)}$ $\leq 5,000^{(5)}$	$\leq 200^{(6)}$
I	Secondary contact recreation and fishing. Suitable for fish, shellfish and wildlife propagation and survival.	≥ 4.0	$\leq 10,000^{(6)}$	$\leq 2,000^{(6)}$
SD	Fishing. Suitable for fish, shellfish and wildlife survival. Waters with natural or man-made conditions limiting attainment of higher standards.	≥ 3.0	N/A	N/A

⁽¹⁾ Chronic standard based on daily average. The DO concentration may fall below 4.8 mg/L for a limited number of days, as defined by the formula:

$$DO_i = \frac{13.0}{2.80 + 1.84e^{-0.1t_i}}$$

where DO_i = DO concentration in mg/L between 3.0 – 4.8 mg/L and t_i = time in days. This equation is applied by dividing the DO range of 3.0 – 4.8 mg/L into a number of equal intervals. DO_i is the lower bound of each interval (i) and t_i is the allowable number of days that the DO concentration can be within that interval. The actual number of days that the measured DO concentration falls within each interval (i) is divided by the allowable number of days that the DO can fall within interval (t_i). The sum of the quotients of all intervals (i ... n) cannot exceed 1.0: i.e.,

$$\sum_{i=1}^n \frac{t_i \text{ (actual)}}{t_i \text{ (allowed)}} < 1.0$$

⁽²⁾ Acute standard (never less than 3.0 mg/L).

⁽³⁾ Median most probable number (MPN) value in any series of representative samples.

⁽⁴⁾ Monthly median value of five or more samples.

⁽⁵⁾ Monthly 80th percentile of five or more samples.

⁽⁶⁾ Monthly geometric mean of five or more samples.

that 80 percent of the measurements be less than 5,000 per 100 mL. Fecal coliform standards for Little Neck Bay require a monthly geometric mean less than 200 per 100 mL from a minimum of five samples. Bathing is practiced within Little Neck Bay at the Douglas Manor Association Beach.

An additional NYSDEC standard for primary contact recreational waters such as Little Neck Bay (Class SB) is a maximum allowable enterococci concentration of a 30-day moving geometric mean of 35 per 100 mL for a representative number of samples. This standard, although not promulgated, is now an enforceable standard in New York State since the USEPA established January 1, 2005 as the date upon which the criteria must be adopted for all coastal recreational waters. The enterococcus standard does not apply to Alley Creek (or other Class I waters).

For designated bathing beach areas, the USEPA criteria require that an enterococcus reference level of 104 per 100 mL to be used by agencies for announcing bathing advisories or beach closings in response to pollution events. The Douglas Manor Association (DMA) is a private club given a permit to operate a beach by New York City Department of Health and Mental Hygiene (NYCDOHMH). NYCDOHMH uses a 30-day moving geometric mean (GM) of 35 enterococcus. If the geometric mean is greater than 35 enterococcus/100 mL, the beach is closed pending additional analysis. An enterococcus of 104 is an advisory upper limit. If beach enterococcus data are greater than 104 per 100 mL, a pollution advisory is posted on the web-site. Additional sampling is initiated and the advisory is removed when water quality is acceptable. Advisories are posted at the beach and on the agency web-site. In addition, there is a preemptive standing advisory for DMA Beach for no swimming for 48 hours after a rainfall of 0.2 inches in 2 hours or a rainfall of 0.4 inches in 24 hours.

For non-designated beach areas of primary contact recreation, which are used infrequently for primary contact, the USEPA criteria require that an enterococcus reference level of 501 per 100 mL be considered indicative of pollution events. Little Neck Bay is classified SB (primary contact recreation use). However, with the exception of the DMA Beach, Little Neck Bay is used infrequently for primary contact recreation. These reference levels, according to the USEPA documents, are not standards but are to be used as determined by the state agencies in making decisions related to recreational uses and pollution control needs. For bathing beaches, these reference levels are to be used for announcing beach advisories or beach closings in response to pollution events.

Narrative Standards

In addition to numerical standards, New York State also has narrative criteria to protect aesthetics in all waters within its jurisdiction, regardless of classification. These standards also serve as limits on discharges to receiving waters within the State. Unlike the numeric standards, which provide an acceptable concentration, narrative criteria generally prohibit quantities that would impair the designated use or have a substantial deleterious effect on aesthetics. Important exceptions include garbage, cinders, ashes, oils, sludge and other refuse, which are prohibited in any amounts. The term “other refuse” has been interpreted to include floatable materials such as street litter that find their way into receiving waters via uncontrolled CSO discharges. It should be noted that, in August 2004, USEPA Region II recommended NYSDEC “Revise the narrative criteria for aesthetics to clarify that these criteria are meant to protect the best use(s) of the water,

and not literally require “none” in any amount, or provide a written clarification to this end.” Table 1-2 summarizes the narrative water quality standards.

Table 1-2. New York State Narrative Water Quality Standards

Parameters	Classes	Standard
Taste-, color-, and odor producing toxic and other deleterious substances	SA, SB, SC, I, SD A, B, C, D	None in amounts that will adversely affect the taste, color or odor thereof, or impair the waters for their best usages.
Turbidity	SA, SB, SC, I, SD A, B, C, D	No increase that will cause a substantial visible contrast to natural conditions.
Suspended, colloidal and settleable solids	SA, SB, SC, I, SD A, B, C, D	None from sewage, industrial wastes or other wastes that will cause deposition or impair the waters for their best usages.
Oil and floating substances	SA, SB, SC, I, SD A, B, C, D	No residue attributable to sewage, industrial wastes or other wastes, nor visible oil film nor globules of grease.
Garbage, cinders, ashes, oils, sludge and other refuse	SA, SB, SC, I, SD A, B, C, D	None in any amounts.
Phosphorus and nitrogen	SA, SB, SC, I, SD A, B, C, D	None in any amounts that will result in growth of algae, weeds and slimes that will impair the waters for their best usages.

1.2.4 Interstate Environmental Commission (IEC)

The States of New York, New Jersey, and Connecticut are signatory to the Tri-State Compact that designated the Interstate Environmental District and created the IEC. The Interstate Environmental District includes all tidal waters of greater New York City. Originally established as the Interstate Sanitation Commission, the IEC may develop and enforce waterbody classifications and effluent standards to protect waterbody uses within the Interstate Environmental District. The applied classifications and effluent standards are intended to be consistent with those applied by the signatory states. There are three waterbody classifications defined by the IEC, as shown in Table 1-3.

Table 1-3. Interstate Environmental Commission Numeric Water Quality Standards

Class	Usage	DO (mg/L)	Waterbodies
A	All forms of primary and secondary contact recreation, fish propagation, and shellfish harvesting in designated areas	≥ 5.0	East R. east of the Whitestone Br.; Hudson R. north of confluence with the Harlem R.; Raritan R. east of the Victory Br. into Raritan Bay; Sandy Hook Bay; lower New York Bay; Atlantic Ocean
B-1	Fishing and secondary contact recreation, growth and maintenance of fish and other forms of marine life naturally occurring therein, but may not be suitable for fish propagation.	≥ 4.0	Hudson R. south of confluence with Harlem R.; upper New York Harbor; East R. from the Battery to the Whitestone Bridge; Harlem R.; Arthur Kill between Raritan Bay and Outerbridge Crossing.
B-2	Passage of anadromous fish, maintenance of fish life	≥ 3.0	Arthur Kill north of Outerbridge Crossing; Newark Bay; Kill Van Kull

In general, IEC water quality regulations require that all waters of the Interstate Environmental District are free from floating and settleable solids, oil, grease, sludge deposits, and unnatural color or turbidity to the extent necessary to avoid unpleasant aesthetics, detrimental impacts to the natural biota, or use impacts. The regulations also prohibit the presence of toxic or deleterious substances that would be detrimental to fish, offensive to humans, or unhealthful in biota used for human consumption. The IEC also restricts CSO discharges to within 24 hours of a precipitation event, consistent with the NYSDEC definition of a prohibited dry weather discharge. IEC effluent quality regulations do not apply to CSOs if the combined sewer system is being operated with reasonable care, maintenance, and efficiency. Although IEC regulations are intended to be consistent with state water quality standards, the three-tiered IEC system and the five New York State marine classifications in New York Harbor do not spatially overlap exactly. Alley Creek and Little Neck Bay are interstate waters and are regulated by IEC as Class A waters.

1.2.5 Administrative Consent Order

New York City's 14 SPDES permits contain conditions designed to comply with federal and state CSO requirements. NYCDEP was unable to comply with deadlines imposed in their 1988 permits for completion of four CSO abatement projects initiated in the early 1980s. As a result, NYCDEP entered into an Administrative Consent Order with NYSDEC on June 26, 1992 which was incorporated into the SPDES permits with a provision stating that the Consent Order governs NYCDEP obligations for its CSO program. It also required NYCDEP to implement CSO abatement projects in nine facility planning areas divided into two tracks: those areas where dissolved oxygen and coliform standards were being contravened (Track One), and those areas for which floatables control was necessary (Track Two). The 1992 Order was modified on September 19, 1996 to add catch basin cleaning, construction, and repair programs.

NYCDEP and NYSDEC negotiated a new Consent Order that was signed January 15, 2005. The 2005 CSO Consent Order supersedes the 1992 Order and its 1996 Modifications with the intent to bring all NYCDEP CSO-related matters into compliance with the provisions of the Clean Water Act and Environmental Conservation Law. The 2005 Order contains requirements to evaluate and implement CSO abatement strategies on an enforceable timetable for 18 waterbodies and, ultimately, for city-wide long-term CSO control in accordance with USEPA CSO Control Policy. This order was modified and the modification was executed on April 14, 2008. NYCDEP and NYSDEC also entered into a separate Memorandum of Understanding (MOU) to facilitate water quality standards reviews in accordance with the CSO Control Policy.

1.3 CITY POLICIES AND OTHER LOCAL CONSIDERATIONS

New York City's waterfront is approximately 578 miles long, encompassing 17 percent of the total shoreline of the State. This resource is managed through multiple tiers of zoning, regulation, public policy, and investment incentives to accommodate the diverse interests of the waterfront communities and encourage environmental stewardship. The local regulatory considerations are primarily applicable to proposed projects and, as such, do not preclude the existence of non-conforming waterfront uses. However, evaluation of existing conditions within the context of these land use controls and public policy can anticipate the nature of long-term growth in the watershed.

1.3.1 New York City Waterfront Revitalization Program

The New York City Waterfront Revitalization Program (WRP) is the City's principal coastal zone management tool and is implemented by the New York City Department of City Planning. The WRP establishes the City's policies for development and use of the waterfront and provides a framework for evaluating the consistency of all discretionary actions in the coastal zone with City coastal management policies. Projects subject to consistency review include any project located within the coastal zone requiring a local, state, or federal discretionary action, such as a Uniform Land Use Review Procedure (ULURP) or a City Environmental Quality Review (CEQR). An action is determined to be consistent with the WRP if it would not substantially hinder and, where practicable, would advance one or more of the ten WRP policies. The New York City WRP is authorized under the New York State Waterfront Revitalization and Coastal Resource Act of 1981 that, in turn, stems from the Federal Coastal Zone Management Act of 1972. The original WRP was adopted in 1982 as a local plan in accordance with Section 197-a of the City Charter, and incorporated the 44 state policies, added 12 local policies, and delineated a coastal zone to which the policies would apply. The program was revised in 1999, and the new WRP policies were issued in September 2002. The revised WRP condensed the 12 original policies into 10 policies: (1) residential and commercial redevelopment; (2) water-dependent and industrial uses; (3) commercial and recreational boating; (4) coastal ecological systems; (5) water quality; (6) flooding and erosion; (7) solid waste and hazardous substances; (8) public access; (9) scenic resources; and (10) historical and cultural resources.

1.3.2 New York City Comprehensive Waterfront Plan

The City's long-range goals are contained in the Comprehensive Waterfront Plan (CWP). The CWP identifies four principal waterfront functional areas (natural, public, working, and redeveloping) and promotes use, protection, and redevelopment in appropriate waterfront areas. The companion Borough Waterfront Plans (1993-1994) assess local conditions and propose strategies to guide land use change, planning and coordination, and public investment for each of the waterfront functional areas. The CWP has been incorporated into local law through land use changes, zoning text amendments, public investment strategies, and regulatory revisions, providing geographic specificity to the WRP and acknowledging that certain policies are more relevant than others on particular portions of the waterfront.

1.3.3 Department of City Planning Actions

The New York City Department of City Planning (NYCDCP) was contacted to identify any projects either under consideration or in the planning stages that could substantially alter the land use in the vicinity of Alley Creek and Little Neck Bay. NYCDCP reviews any proposal that would result in a fundamental alteration in land use, such as zoning map and text amendments, special permits under the Zoning Resolution, changes in the City Map, the disposition of city-owned property, and the siting of public facilities. In addition, NYCDCP maintains a library of City-wide plans, assessments of infrastructure, community needs evaluations, and land use impact studies. These records were reviewed and evaluated for their potential impacts to waterbody use and runoff characteristics, and the NYCDCP community district liaison for Queens Community Board 11 was contacted to determine whether any proposals in process that required NYCDCP review might impact this WB/WS Facility Plan.

1.3.4 New York City Economic Development Corporation

The New York City Economic Development Corporation (NYCEDC) was contacted to identify any projects either under consideration or in the planning stages that could substantially alter the land use in the vicinity of Alley Creek and Little Neck Bay. The NYCEDC is charged with dispensing City-owned property to businesses as a means of stimulating economic growth, employment, and tax revenue in the City of New York while simultaneously encouraging specific types of land use in targeted neighborhoods. As such, NYCEDC has the potential to alter land use on a large scale.

In addition, NYCEDC serves as a policy instrument for the Mayor's Office. For example, NYCEDC recently issued a white paper on industrial zoning intended to create and protect industrial land uses throughout the City (Office of the Mayor, 2005). The policy directs the replacement of the current In-Place Industrial Parks (IPIPs) with Industrial Business Zones (IBZs) that more accurately reflect the City's industrial areas. Policies of this nature can have implications on future uses of a waterbody as well as impacts to collection systems, so a thorough review of NYCEDC policy and future projects was performed to determine the extent to which they may impact the WB/WS Facility Plan.

1.3.5 Local Law

Local law is a form of municipal legislation that has the same status as an act of the State Legislature. The power to enact local laws is granted by the New York State Constitution, with the scope and procedures for implementation established in the Municipal Home Rule Law. In New York City, local laws pertaining to the use of City waterways and initiatives associated with aquatic health have been adopted beyond the requirements of New York State. Recent adoptions include Local Law 71 of 2005, which required the development of the Jamaica Bay Watershed Protection Plan (JBWPP), and Local Law 5 of 2008, which requires City-owned building or City-funded reconstruction to include certain sustainable practices, as well as requiring the City to draft a sustainable stormwater management plan by Oct. 1, 2008. These initiatives are discussed in Section 5 in detail.

1.3.6 Bathing Beaches

Local law includes the requirements for operation and maintenance and siting of bathing beaches. Therefore, siting requirements imposed by State and City codes must be considered to evaluate the potential use of a waterbody for primary contact recreation. These requirements include minimum distances from certain types of regulated discharges (such as CSO outfalls), maximum bottom slopes, acceptable bottom materials, minimum water quality levels, and physical conditions that ensure the highest level of safety for bathers.

Bathing beaches in New York City are regulated, monitored, and permitted by the City and State under Article 167 of the New York City Health Code and Section 6-2.19 of the New York City Sanitary Code. Douglas Manor Association Beach is a private beach within the Alley Creek and Little Neck Bay Assessment Area located on the southeast shore of Little Neck Bay on the Douglaston Peninsula.

1.4 REPORT DESCRIPTION

This report has been organized to clearly describe the proposed WB/WS Facility Plan that supports the Long-Term CSO Control Planning process and the environmental factors and engineering considerations that were evaluated in its development. The nine elements of long-term CSO control planning are listed in Table 1-4 along with relevant sections within the present document for cross-referencing. Section 1.0 presents general planning information and regulatory considerations that informed the WB/WS Facility Plan development. Sections 2.0, 3.0, and 4.0 describe the watershed characteristics, existing sewer system facilities and waterbody characteristics, respectively. Section 5.0 describes related waterbody improvement projects within the waterbody and the greater New York Harbor. Section 6.0 describes the public participation and agency interaction that went into the development of this WB/WS Facility Plan, as well as an overview of the NYCDEP public outreach program. Sections 7.0 and 8.0 describe the alternatives evaluation performed in the development of the recommended plan. Section 9.0 discusses the review and revision of water quality standards. The report concludes with references in Section 10.0 and a glossary of terms and abbreviations in Section 11.0. Attached for reference are the Wet Weather Operating Plans for the Tallman Island WPCP and the Alley Creek CSO Storage Facility, Tallman Island WPCP Schematics with and without the Alley Creek CSO Retention Tank, model alternative results, public opinion survey results, and Stakeholder Team meeting notes.

**Table 1-4. Report Locations of the
Nine Elements of Long-Term Control Planning**

No.	Element	Location(s) within Report
1	Characterization of the Combined Sewer System	3.0
2	Public Participation	6.0
3	Consideration of Sensitive Areas	4.7
4	Evaluation of Alternatives	7.0
5	Cost/Performance Considerations	7.0
6	Operational Plan	8.0
7	Maximizing Treatment at the Existing WPCP	7.0 and 8.0
8	Implementation Schedule	8.0
9	Post-Construction Compliance Monitoring	8.0